

Application No. 10/675,374  
Amendment Dated August 6, 2006  
Reply to Office Action Dated: June 7, 2006

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## REMARKS/ARGUMENTS

### Introductory Remarks:

Claims 1-33 were pending in this Application, and had previously been made subject to a Restriction Requirement. There had been some confusion about which claims were being restricted, and the Examiner clarified this point in the most recent Office Action. The undersigned appreciates the explanation provided by the Examiner. Accordingly, claim 16 has been canceled, without prejudice, as being drawn to a non-elected invention.

However, Applicant does want to comment on one point made in the explanation regarding Restriction. In the fourth paragraph of page 2, the Examiner refers to the "core" claimed in the Application as having "...no specific dimensional attributes...", as compared to a mold. Applicant respectfully disagrees. A mold certainly does connote a hollowed-out shape which represents an exterior surface of an article which will be cast in the mold, as the Examiner indicates. However, the core represents a shape which will define the interior regions of the cast article, and thus has a very defined shape as well. (As alluded to in the specification, the shape of the core is sometimes very complex, since it must replicate the designed interior regions with such a high level of accuracy). This point is important for a reason beyond the Restriction issue: Ceramic cores used in investment casting have definite dimensions. Thus, by themselves, the cores should be deemed to have all of the patentable attributes of any other article, such as the casting molds.

### Claim Objections

Claim 5 had been objected to because of the use of the conjunction "and", in describing various ceramic powders. The undersigned is in full agreement with the Examiner, and also confirms that the intent of the phrasing is that the various claim constituents are meant to be present in the alternative (i.e., with "or", unless there are combinations present), and not that each constituent must be present. In order to try to clarify the language, both claim 5 and claim 6 have been rephrased with Markush-type language, allowing for the use of "and". The undersigned has noted

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that different formats for Markush language seem to have materialized over the years, and if the Examiner wishes to discuss adjustment of the currently-inserted language, that discussion would be welcome. The objection to claim 8 has also been dealt with, and Applicant appreciates the Examiner's review of this language.

### Claim Rejections

#### Section 112

Claims 18 and 27 remain rejected on a Section 112 basis, in regard to the subscript "a". (Applicant assumes the Examiner is referring here to claim 28, rather than claim 27). This issue was addressed in the previous Response. While Applicant continues to believe that the current language is appropriate, the suggested change has been made in claims 18 and 28 (and claim 9), so that "a" is equal to 0 or 1. In fact, the undersigned believes he has a better understanding of the Examiner's point here. Thus, if "a" is 1, i.e., a single divalent hydrocarbon radical/group, and that radical can itself contain a number of moieties or atoms within it, the amended language is a very appropriate construction. As an example, the single divalent radical could contain 1 to about 8 carbon atoms in a primary chain which has two "ends".

#### Section 102 Rejections

The claims listed in the first three paragraphs on page 5 of the Office Action continue to be rejected as being anticipated by the three references listed previously: Mine et al, Atwell et al, and Schilling, Jr. et al (U.S. Patents 4,269,753, 4,888,376, and 5,162,480, respectively). These issues have been examined at considerable length in the previous Response. In brief, the present inventors discovered a unique silicone matrix suitable for containing a ceramic powder used in making casting molds and cores. The material exhibits the liquid-like viscosity required for molding in certain types of situations, but which can then be polymerized into a firm, strong green body, and fired into a part which exhibits minimal shrinkage. The silicone matrix is provided with a high degree of reactivity, i.e., via certain alkenyl and hydride functional groups. Moreover, in some preferred embodiments, the silicone matrix is substantially free of solvent, prior to polymerization.

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In order to reduce the issues present in prosecution, claim 1 has been amended, bringing in a set of limitations which support specific embodiments. Thus, the green product comprises a selected amount of the silicone monomers/oligomers used in the matrix. Moreover, the matrix is restricted to highly-functional materials which include at least three alkenyl reactive functional groups or three hydride reactive functional groups (or at least three of each type of group). Furthermore, the silicone matrix is restricted to relatively low viscosities, i.e., about 1 to about 1,000 centistokes. Moreover, the matrix is substantially free of solvent. All of these limitations result in a composition which meets the specific requirements mentioned above and discussed at length in the specification.

All three of the cited references fail to describe compositions which contain all of the elements of amended claim 1. As an example, while the Mine patent certainly describes the broad field of siloxane compositions which contain ceramic materials, it does not include all of the specific limitations in the claim. Applicant reviewed the sections pointed out by the Examiner in Mine. However, Applicant continues to maintain that the patent fails to describe compositions which must contain the high alkenyl/hydride reactivity, along with the relatively low viscosity recited in claim 1. (On that point, Applicant notes that, while different viscosity parameters are presented in the specification, the particular limitation in claim 1 refers to the silicone matrix itself. This viscosity limitation is representative of the viscosity of the overall matrix-ceramic powder system, in a way which permits adequate comparison with similar systems of the prior art). Moreover, (and in reference to the Examiner's point on page 8 of the Office Action), Applicant continues to maintain that the cited references fail to describe compositions which must be substantially free of solvents.

Without going into the extensive detail of the first Response, Applicant does maintain that Atwell fails to contain the limitations of amended claim 1. Again, this reference fails to disclose compositions with the high degree of functionality now recited in the claim. Furthermore, while describing the viscosity of certain constituents, the reference does not disclose a required, overall viscosity for the silicone matrix, as in the present invention. Applicant reviewed the referenced

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examples in the patent, but still maintains that they do not contain the limitations on viscosity and functional groups now present in claim 1.

Moreover, the Schilling patent also fails to disclose monomers/oligomers with the high level of functionality required in claim 1. Furthermore, the ceramic component appears to be optional (see col. 6, lines 29-34), and the scope of the possible ceramic constituents appears to be limited. The reference also has nothing to do with ceramic cores, or methods for making them.

Applicant continues to maintain that the method claims are also not anticipated by the references. For example, none of the three patents describes methods which contain the limitations of amended claim 28. The limitations on functionality and viscosity are key to processes used to make the shells and cores.

### Section 103 Rejections

Various claims continue to be rejected on the basis of obviousness. Applicant's position in this regard is similar to that taken in the previous Response. In general, none of the references ever suggests compositions or methods which are specifically directed to the preparation of casting cores and molds, and which address the problems outlined in Applicant's specification. As but one example, Mine is directed specifically to wire coatings, which have performance requirements calling for different inventive concepts than those of the present invention.

### Conclusion

Many changes have been made to the claims, to comply with various objections and Section 112 rejections, and to recite specific embodiments which contain distinguishing limitations. No new matter has been added, since the amended language is taken from the existing specification, and/or is generally in line with the intended meaning of language in the Application. The claims now appear to be in allowable form, and certainly in better form for appeal. The undersigned would be very interested in discussing any remaining issues with the Examiner.

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Respectfully submitted,

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